REMARKS

Enclosed are formal drawings as required by the outstanding Office Action. Claims 19 and 28 have been amended to place them in independent form with all the limitations of originally filed claims 1 and 10. Entry of the amendment and the drawings is respectfully requested.

Claims 19-21 and 28-30 have been rejected under 35 U.S.C § 102(e) as anticipated by Wu et al. U.S. Patent No. 6,521,041, hereinafter Wu. Applicants respectfully traverse this rejection for the following reasons.

Wu and the present invention both recognize that silicon can be etches using various etchants. Both recognize that boron doped silicon is an effective substrate for etching, but that such a material has other problems that prevent it from being as commercially viable as would be desired by semiconductor manufacturers and fabricators. Wu solves this problem by eliminating the boron and adding enough germanium to make an alloy, and in fact shows that a silicon and germanium alloy must have at least about eighteen percent (18%) germanium or more in order to be etched as shown in the Wu patent.

By contrast, Applicants have left the boron in the silicon and have doped the silicon with about one percent (1%), so that the resulting material is not an alloy of silicon and germanium but is germanium doped silicon. This is not semantics. An alloy of two materials is totally and entirely different from one of the materials doped with the other. They have different chemical compositions, behave in different ways, have different properties and, specifically, result in different etched substrates with different properties.

Wu specifically states in the abstract that silicon is etched when the silicon is "any silicon containing less that $7x10^{19}cm^{-3}$ of boron or

undoped $Si_{1-x}Ge_x$ alloys with x less than approximately 18." The reference is totally silent about the etching properties of silicon that is doped with boron and about 1% germanium. Wu teaches that the etching properties of the 18% germanium alloys "is attributed to the change in energy band structure by the addition of germanium." This does not happen when the silicon is doped with both boron and 1% germanium. The materials are different in kind.

The Examiner has cited Wu at column 10, lines 20-25 as showing a low concentration of germanium. This is not true. The smallest concentration of germanium is eight (8.45) times greater than $1x10^{21}$ cm^{-3} germanium. It is between four and sixteen times the range recited in claims 20 and 29. It is respectfully submitted that this is an improper reading of the reference because the reference requires an alloy, does not suggest that the WU_3 is boron and germanium doped silicon. In fact, these alloys do not have any boron doping. The citation of a boron silicon material on column 4, line 51, does not teach or suggest a silicon that has been doped with boron and germanium but is not an alloy of silicon and germanium. Reconsideration of the citations is respectfully urged.

Wu does disclose that silicon has been doped with boron. So have applicants. That is known, and so are the problems of boron doped silicon wafers. Wu eliminates the boron and adds 18% germanium to make an allow. Applicants keep the boron and dope the silicon (for it remains silicon) with about 1% germanium. These two opposite approaches result in two opposite materials. Wu does not disclose silicon doped with boron and 1% germanium and thus cannot be said to anticipate the claims pending in this application. Reconsideration and withdrawal of the rejection is earnestly solicited.

In addition, Wu does not make obvious the present invention under 35 U.S.C § 103. Wu explicitly teaches silicon doped with boron (prior art) or a silicon germanium alloy with at least 18% germanium. To modify

this reference by adding only 1% germanium to the boron doped silicon would explicitly contravene the teachings of the reference that says that effective etching is only possible with at least 18% germanium and the silicon is in an alloy form with a changed energy band structure. The most one skilled in the art would do to Wu would (possibly, for the purposes of argument) add 18% germanium to a boron doped silicon to form a boron doped alloy of silicon and germanium. This still is not the present invention.

Applicants independent claims are limited to boron doped silicon which has also been doped with about 1% germanium. Specifically, claims 19 and 28 recite that the silicon have "a germanium content of about $1x10^{21}$ cm^{-3}" and, in dependent claims 20 and 29 recite that "the germanium content is from about O.5 $x10^{21}$ cm^{-3} to about 2.0 $x10^{21}$ cm^{-3}."

The other claims have been rejected on a combination of Wu and two references cited to show specific electronic components such as dielectrically isolated piezoresistors and resonant microbeams (Stemme) or resist shock (nilsson). Neither secondary reference discloses boron and germanium doped silicon and thus add nothing to the deficiencies of Wu. Withdrawal of the remaining rejections and favorable consideration of the instant claims is requested.

As required by the rules, clean copies of the specification and claims as amended are attached hereto. It is respectfully requested that the Examiner consider the amendments and remarks herein, and pass this application to issue.

If the Examiner considers this case ready for conclusion, other than by allowance, he is respectfully requested to call Applicant's attorney at the number listed below.

DATE: August 21, 2003

Respectfully submitted,
Robert Horning et al.

By their Attorney

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CERTIFICATE OF MAILING

I hereby certify that the attached correspondence is being deposited with the United States Postal Service and First Class Mail in an envelope addressed to: Commissioner for Patents, Mail Stop amendment with fee, PO Box 1450, Alexandria, VA 22313-1450, on the date appearing below.

DATE: August 21, 2003

Respectfully submitted,

John S. Munday

Clean Copy of Claims as Amended

19. A device produced according to the method of making a silicon micromechanical structure, comprising the steps of:

forming a lightly doped silicon substrate having a first and second side and having less than $5x10^{19}$ cm^{-3} boron therein;

placing a p+ layer on the first side of said substrate, said p+ having a boron content of greater than $7x10^{19}$ cm^{-3} and a germanium content of about $1x10^{21}$ cm^{-3};

forming a mask on the second side for etching a predetermined pattern;

etching said second side to said p+ layer; and

depositing an insulator on said p+ layer and fabricating an electronic component on said insulator.

28. A device produced according to the method of making a silicon micromechanical structure, comprising the steps of:

forming a lightly doped silicon substrate having a first and second side and having less than $5x10^{19}$ cm^{-3} boron therein;

placing a p+ layer on the first side of said substrate, said p+ having a boron content of greater than $7x10^{19}$ cm^{-3} and a germanium content of about $1x10^{21}$ cm^{-3};

forming a lightly doped layer on said p+ layer to form a buried p+ layer;

forming a mask on the second side for etching a predetermined pattern;

etching said second side to said buried p+ layer; and

depositing an insulator on said lightly doped layer and fabricating an electronic component on said insulator.

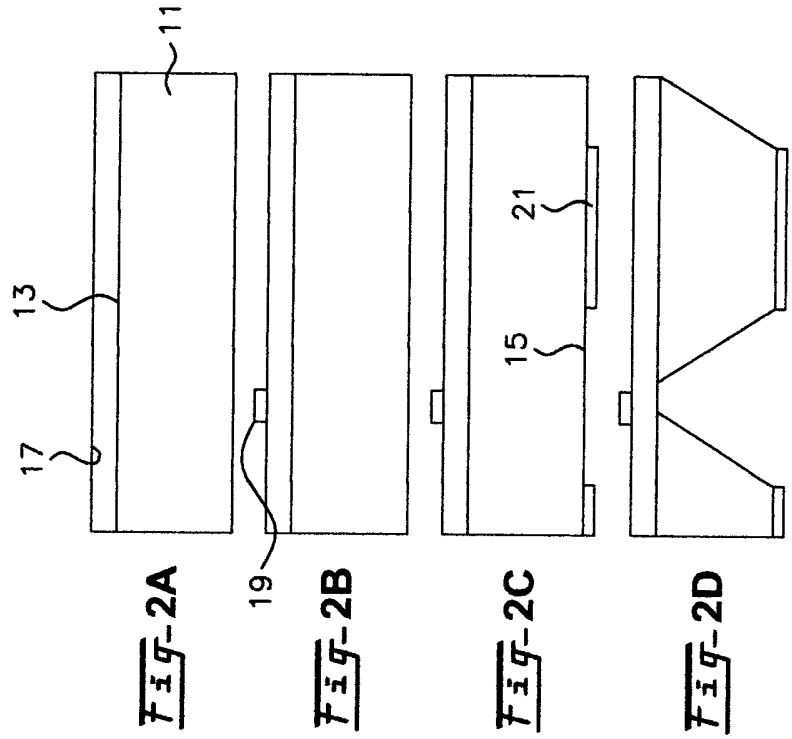

Fig-2A Fig-2B Fig-2C Fig-2D

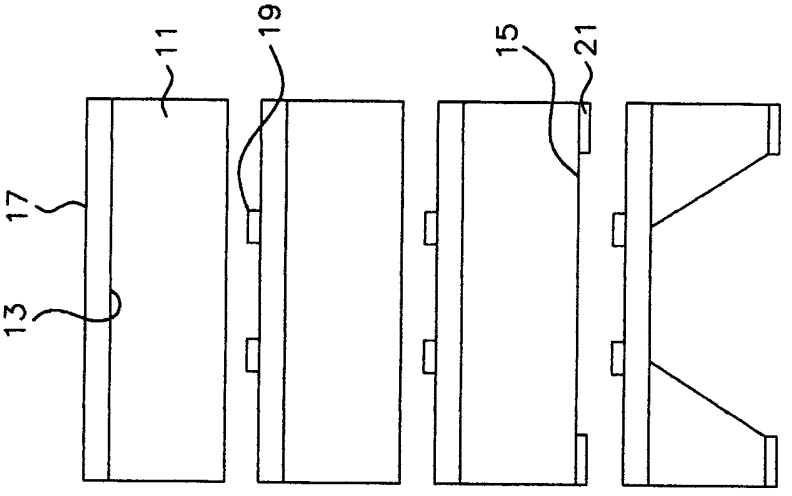

Fig-1A Fig-1B Fig-1C Fig-1D

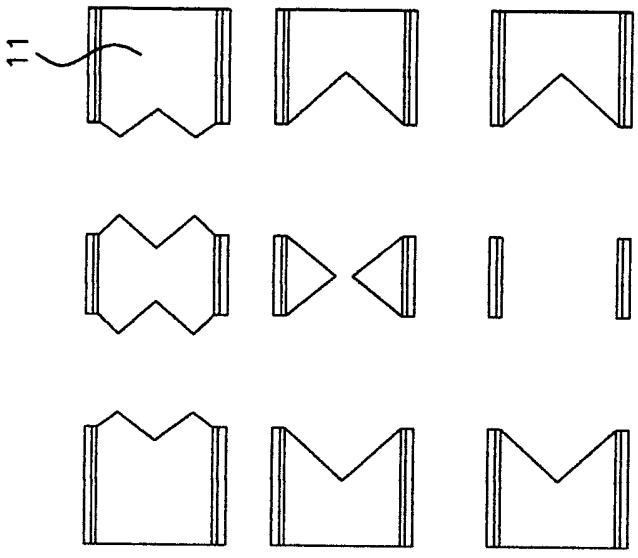

Fig-3E Fig-3F Fig-3G

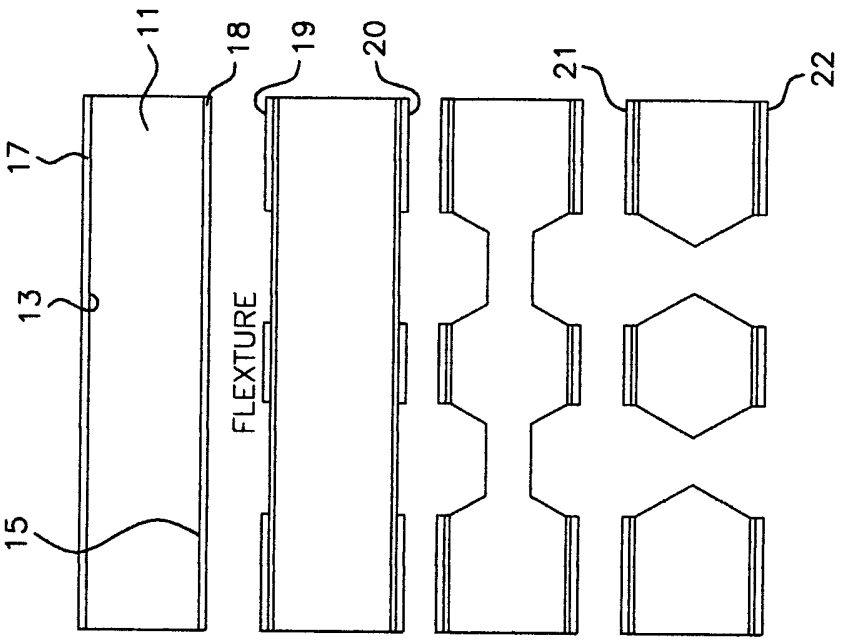

Fig-3A Fig-3B Fig-3C Fig-3D

Fig-5A

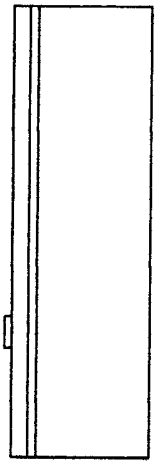

Fig-5B

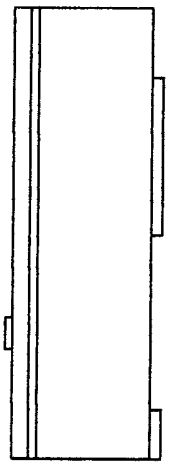

Fig-5C

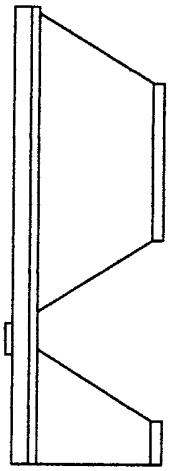

Fig-5D

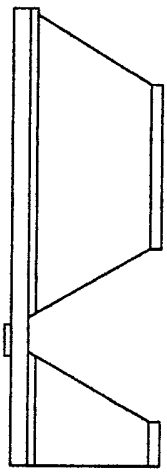

Fig-5E

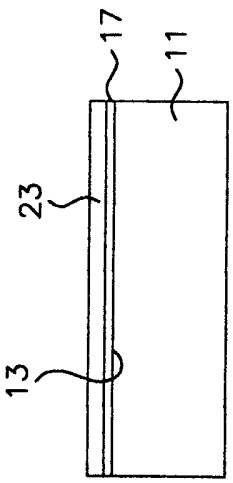

Fig-4A

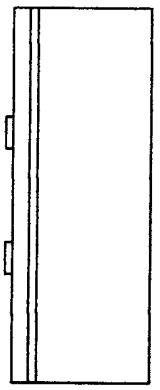

Fig-4B

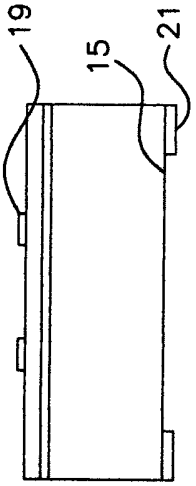

Fig-4C

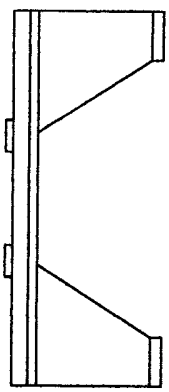

Fig-4D

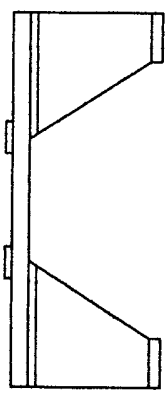

Fig-4E

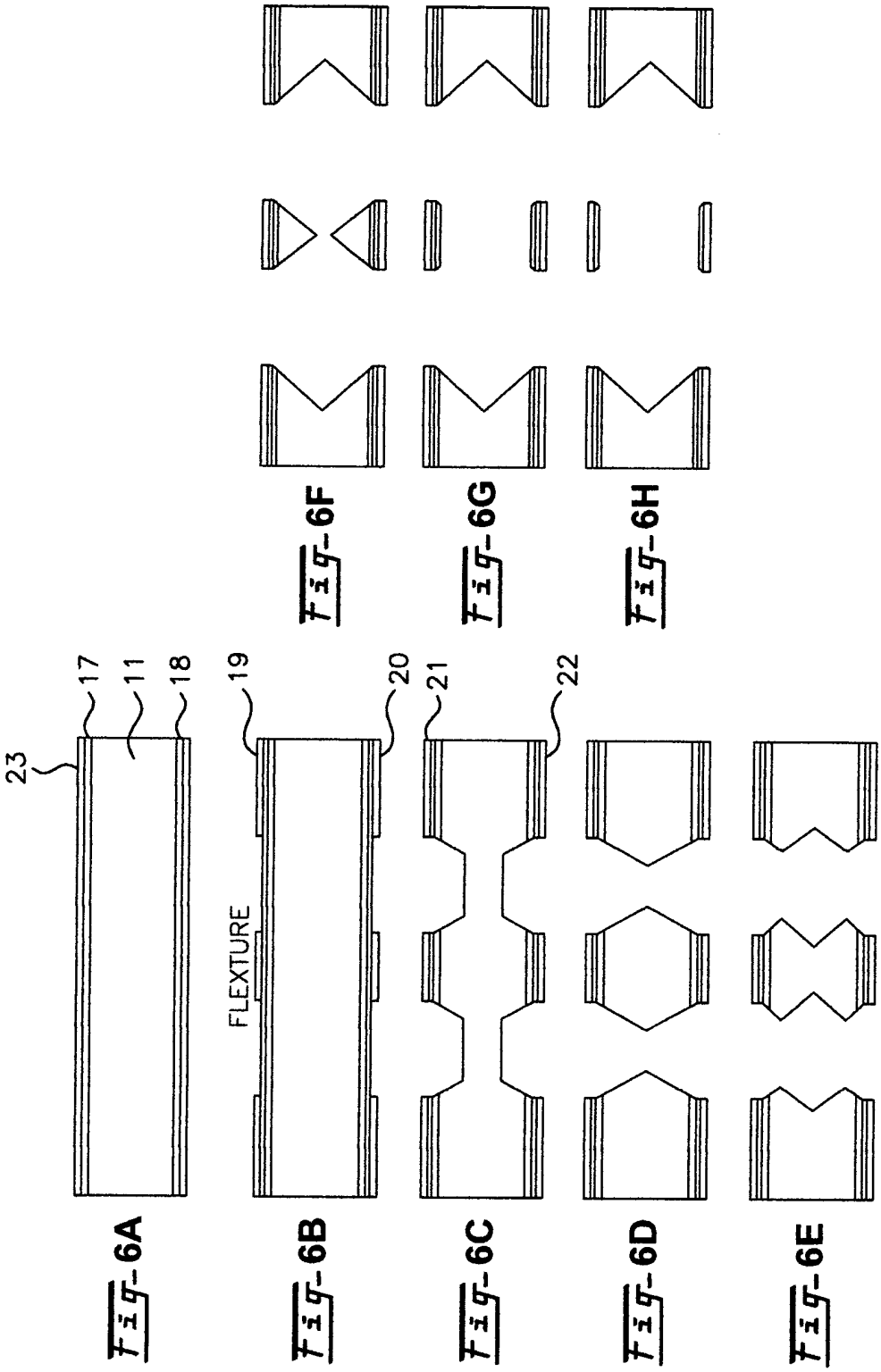

Fig-6A Fig-6B Fig-6C Fig-6D Fig-6E Fig-6F Fig-6G Fig-6H